Statement

Prior to assuming my responsibilities at API, I participated in the development of the ARIES communications model, in which vast amounts of data can be transmitted at high speeds from remote locations ("the ARIES model"). The ARIES model makes integrated voice, video, and data transmissions possible, in part, by use of a digital satellite link, NASA's Advanced Communication Technology Satellite ("ACTS"), in conjunction with asynchronous transfer mode ("ATM") networking. An April 8, 1996 New York Times newspaper article, a copy of which is appended hereto as Exhibit A, offers an overview of both the ARIES model and key technologies critical to its success.

The industries represented by the API are among those most willing to consider using early, or newer, technologies, such as those based on the ARIES model. These industries perceive new technologies as offering innovative approaches necessary to facilitate breakthroughs in their core businesses.

Sophisticated customer premise equipment (CPE), like that used in the ARIES model, is capable of integrating voice, video, and data and reserving necessary bandwidth, depending upon the traffic mix. Using sophisticated technologies, an end-user can transmit not one but three distinct data streams, each with its own transmission requirements, using a single telecommunications service, such as ATM.

Customers having information- or bandwidth-intensive communications needs are interested in exploring and commercializing the possibilities that are associated with sophisticated and increasingly intelligent CPE. To help these customers fully realize the possibilities of this technology, the Commission should eliminate its current prohibition on bundling telecommunications services and CPE (the "bundling prohibition").

First, the bundling prohibition acts as a constraint on a customer's ability to devise an innovative end-to-end communications solution that satisfies that customer's unique needs. This artificial constraint precludes customers from designing an optimum communications network in conjunction with its vendor(s) and/or service provider(s). Rather, the customer is consigned to assembling a network from the "piece-parts" available from service providers and equipment vendors.

Second, by hobbling both sophisticated users and service providers, the bundling prohibition acts as a brake on the development and implementation of advanced communications technology, to the detriment of users, service providers, and the economy as a whole. Stagnation is ensured when a communications service provider is prohibited from exploring the possibilities of a given service with interested customers - an exploration that carries with it the potential for a communications breakthrough. Whether that breakthrough remains of limited value or someday becomes a widely-used "plain vanilla" telecommunications service is up to the marketplace.

Finally, the bundling prohibition adds to a large customer's communications costs; eliminating the prohibition reduces costs, thereby benefitting both that large customer and, indirectly, its customer base. The distinction between "services" and "equipment" was drawn to further regulatory objectives; it is not necessarily conducive to advances in technology. As technological breakthroughs continue to blur the line between "equipment" and "service," the cost of maintaining this regulatory demarcation increases. These costs may be easily quantifiable, such as expenditures for duplicative equipment (which may be incurred by both the customer and service provider). Other costs are less easily quantified, but no less real, such as equipment and service productivities that - given current regulatory strictures - cannot be fully realized.

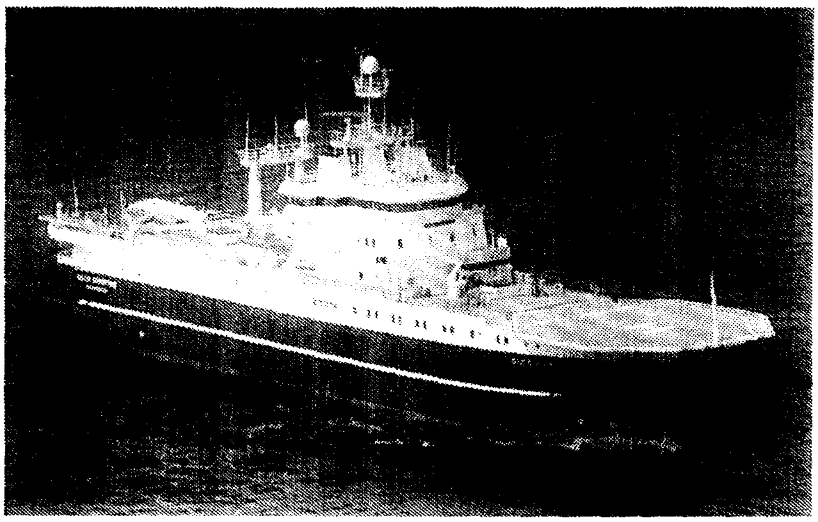
The regulatory objective should be an environment in which the end-user can select and obtain the combination of technologies that best serves its unique needs. We believe that it is appropriate and preferable to let the marketplace decide which combinations of services and equipment best meet users' requirements.

EXHIBIT A

THE NEW YORK TIMES, MONDAY, APRIL 8, 1996

A New Way to Search for Oil, Via Satellite

By AGIS SALPUKAS



Geco-Prakla

The M/V Geco Diamond searches for oil using a new technology that allows the data gathered to be analyzed on the mainland while the ship is still at the site.

A public-private effort to link ships and supercomputers.

Like many a deep-sea fisherman, Richard A. Morneau obsesses about the ones that got away. Take, for example, the whopper off the Angolan coast three years ago — a big deep water oilfield that Mr. Morneau, a geophysicist for the Chevron Corporation, still suspects was down there.

But months had elapsed by the time the ship's seismic readings could be processed by a supercomputer back on land, yielding clues on where to probe further for petroleum. And only then were errors discovered in the original navigational data. The company could not relocate that promising fishing hole.

"Had we known right away," Mr. Morneau recalled, still wistful, "we could have made a correction."

But now, thanks to a communications technology breakthrough with implications that go far beyond the petroleum industry, oil hunters like Mr. Morneau may soon be able to receive billions of bytes of offshore seismic data and process it back on land in "real time." That would enable them to instruct the ship gathering the data to go back quickly for another sweep over a tantalizing spot.

The technology is based on a high-speed satellite system born of a collaboration between the Government and industry. And it promises not only to put a powerful new tool in the hands of the oil industry, but may also have applications for doctors in remote sites or emergency workers coping with disasters in isolated locales.

During a recent demonstration, Mr. Morneau and several colleagues sat excitedly in front of computer screens in a Washington office perusing supercomputer analysis of data gathered minutes earlier from a ship 1,500 miles away. The vessel, the M/V Geco Diamond, towed a set of steel cable "streamers" with hundreds of hydrophones that measured sound waves being bounced off rock and salt formations thousands of feet below the azure surface of the Gulf of Mexico.

Using the satellite's return link, the scientists in Washington communicated by voice, video and text with experts aboard the Geco Diamond, 120 miles offshore from Galveston, Tex., directing them to adjust their course to focus on particularly promising formations.

"This compresses into seconds what often can take a year," Mr. Morneau said, scanning the data.

The breakthrough comes at a time when the oil industry is using ever-more sophisticated seismic analysis to venture into ever-deeper waters to find oilfields — like the giant Mars site that the Shell Oil Company is now developing in 2,940 feet of water in the Gulf of Mexico.

Charles DiBona, president of the American Petroleum Institute, in whose Washington headquarters the demonstration oc-

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A New Way to Seek Undersea Oil, Via Satellite

Continued From First Business Page

curred, said the new satellite capabilities will help the industry's deep-water efforts. "This cuts the cycle time," Mr. DiBona said. "We're talking about producing a lot more oil."

Or maybe even saving lives. As part of the demonstration, Dr. Michael DeBakey, the well-known heart surgeon, sat at a computer terminal at the Institute of Biosciences and Technology in the Texas Medical Center in Houston.

As an audience of doctors and communications experts looked on, Dr. DeBakey studied a cardiogram simulating the heart attack of a crewman in the infirmary aboard the Geco Diamond. He also used video and audio links to observe the crewman's symptoms.

Thus informed, Dr. DeBakey advised the infirmary staff on the steps to take to stabilize the crewman and prepare him for helicopter transport back to shore.

Satellite data transmissions are nothing new, of course. But even today, when one can communicate from almost anywhere, it has been difficult to dispatch vast amounts of data at high speeds from offshore vessels or from remote hospitals or isolated weather stations.

The breakthrough is made possible by a NASA satellite called ACTS. It sends and receives data through powerful, highly concentrated spot beams that can focus on nearly any place in North America and its surrounding waters.

Thus with only two small racks of satellite and telecommunications equipment and a 16-inch antenna, the crew of the Geco Diamond was able to beam up two million bits of seismic data a second to the ACTS satellite 22,300 miles above the Equator. With a second spot beam, temporarily focused on a receiver antenna at the Jet Propulsion Laboratory in Pasadena, Calif., the spacecraft bounced the data back to earth, where it was relayed to Minneapolis for processing by a Cray Research supercomputer.

Within about 15 minutes of the raw data's capture by the Geco Diamond, the supercomputer's analysis was forwarded to the Petroleum Institute and to the Houston research centers of major companies involved in oil exploration that included Amoco, Schlumberger and Shell.

The system is precisely the kind of civilian use of federally backed technology that the Government has been eager to cultivate since the end of the cold war. It was developed over the last two years in a collaboration involving a group of companies including Amoco, Shell, Chevron and Schlumberger; Federal agencies including the Energy Department and NASA, and several of the national research organizations, led by Sandia National Laboratories.

The idea grew out of scribblings on a napkin during dinner two years ago at a microbrewery in San Francisco. The diners were David Beering, a NASA senior telecommunications analyst, and Raymond Cline Jr., a Sandia researcher.

Their thoughts had turned to NASA's launching the previous autumn, in September 1993, of an Advanced Communications Technology Satellite, the first spacecraft that could theoretically handle digital data of up to 622 million bits a second. As the napkin diagram took form, they concluded that their system should operate at about 45 million bits a second. At such speeds the World Book Encyclopedia could be transmitted in about one minute.

Unlike most previous satellites, which might cover the entire continent with a 75-watt signal, NASA's ACTS spacecraft uses high-intensity beams that can focus the 75 watts on a spot only 150 miles in diameter.

These focused beams can provide high-quality transmission through small antennae like the 16 inch by 4 inch flat plate used on the Geco Diamond.

But the ACTS digital satellite link, while crucial, is only the first leg of the trip. The entire setup, known as Aires, is also heavily reliant on the ground-based fiber optic networks operated by telecommunications carriers like AT&T, MCI and Sprint, which have been adopting a new high-speed transmission format known as Asynchronous Transfer Mode networking.

A.T.M., as this technology is known, is a way of shipping digital information in uniform packets that can be sent via satellite, fiber optic or coaxial cable or even copper telephone wire without requiring the costly and time-consuming format conversions that have long dogged data communications.

Mr. Beering said the concept was similar to the shipping industry's development of uniform box-car-like containers that can be handled by truck, boat, train or airplane.

The system uses about $1 billion worth of equipment and communication networks. NASA's cost to build and launch the satellite was about $750 million. The other Government agencies and the corporations involved picked up the additional $250 million in equipment costs.

So far, about 100 companies and research groups have tested the system. The Boeing Company, for example, used the system to link its wind tunnels in Seattle with supercomputers at a NASA research center in Cleveland. Engineers sent wind-tunnel readings on an engine inlet, then used the supercomputer's analysis to make design changes as the tests were still under way.

But it was the oil industry that was particularly interested in getting involved in the Aires project, as petroleum companies look for ways to make more efficient use of data-intensive oil-exploration technology.

Mr. Zernic recalls that when the ACTS satellite program was authorized by Congress in the early 1980's, his agency was eager to show that the effort would have practical applications. And Aires has demonstrated just that, Mr. Zernic contends. "We have to make good with the U.S. taxpayer's dollar," he said.

Probing the Deep With Help From On High

NASA and a consortium of companies have developed a new method of transmitting vast amounts of data at high speeds from remote locations. The system was demonstrated in a search for oil beneath the ocean floor. In the exploration experiment, a surveying ship transmitted the results to shore. There they were made into images and analyzed by scientists. In the past, the process could have taken a year. Now it takes hours or even minutes. This allows scientists ashore to analyze the data, spot a place where oil might be found, and send a message back to the ship, asking it to make another pass.

How it Works
(counterclockwise, from lower right)

1. Seismic surveying ship maps formations beneath the gulf's floor
2. A highly focused spot beam pulls millions of bits of data each second from a 16-by-4 inch antenna aboard the moving ship
3. The satellite is able to beam down its data to any 150-mile circle on the continent. In this case, it is a spot containing NASA's Jet Propulsion Laboratory
4. The data is received at NASA and sent to a supercomputer center in Minnesota
5. The supercomputer translates the seismic data into a geological map
6. The geological map is sent to several cities, including Houston where researchers searched for signs of oil